

thus pending in the application. Reconsideration of the application is respectfully requested.

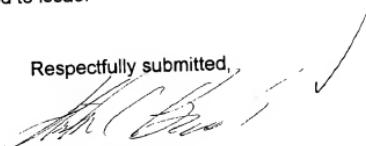
In the Office Action, the Examiner has rejected claim 1 under 35 USC 103(a) as obvious over present admissions of prior art taken with Japanese Kokai 4-267359 to Sumi. Applicants respectfully traverse.

Sumi is directed at preventing the unwanted diffusion of aluminum and silicon from an aluminum-silicon metal layer into a semiconductor device. To prevent the unwanted diffusion, Sumi converts the underlying titanium nitride layer to an amorphous titanium nitride layer, thus destroying grain boundaries, which are paths for fast diffusion of aluminum and silicon.

The present application, on the other hand, is directed at improving the reliability of semiconductor devices by reducing the amount of electromigration in a metal conducting layer, particularly in a damascene structure. With regard to electromigration, the conventional wisdom, before the invention disclosed in the present application, was that a metal layer with uniform grain orientation gave best results. As stated in the application "Conventionally, it is known that depositing the conductive material such that it has a uniform (111) grain orientation improves the film's reliability..." (page 2, lines 3-5). The inventors of the present invention have overturned the conventional wisdom and have showed that, as dimensions in damascene structures have decreased, it is in fact better to have nonuniform or random or amorphous structure in the conducting metal. To solve the problem of electromigration in a way that goes against the conventional wisdom is certainly not obvious. Sumi's use of amorphous titanium nitride for limiting unwanted diffusion through the titanium nitride, while it coincidentally gives random grain structure to the aluminum, gives no hint that the conventional wisdom with regard to electromigration should be abandoned and thus provides no suggestion for the solution of the electromigration problem. Therefore the present invention is not obvious based on the admitted prior art in view of Sumi. In view of this discussion, applicants respectfully request that the rejection of claim 1 be withdrawn.

In view of the remarks set forth above, it is respectfully submitted that the application is in condition for allowance. It is respectfully requested that claims 1-27 be allowed and the application be passed to issue.

Respectfully submitted,



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